

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-15 (cancelled):

Claim 16 (currently amended): A process for production of an artificial tooth substitute to be fitted on a prepared dental stump comprising the steps of:

selecting a ~~preprepared~~ blank of porous ceramic material having a relative density ρ_R and an achievable relative density ρ_S after sintering;

scanning and digitizing a three-dimensional outer and inner surface of a positive model of a skeletal structure for the artificial tooth substitute to obtain data;

determining an enlargement factor (f) for the obtained data in accordance with the following

$$f = \sqrt[3]{\frac{\rho_S}{\rho_R}}$$

where ρ_R is the relative density of the ~~preprepared~~ blank and ρ_S is the achievable relative density after sintering;

enlarging the obtained data linearly in all directions by the enlargement factor (f) thereby compensating precisely for

sinter shrinkage to obtain modified data for an enlarged model;

transferring the modified data to a control unit of a processing machine;

processing the blank of ~~the-preprepared~~ porous ceramic material in the processing machine and removing material therefrom to produce a design form of the enlarged model;

sintering the design form of porous ceramic material to obtain a skeletal structure having precise end dimensions; and

facing the skeletal structure as desired to form the artificial tooth substitute.

Claim 17 (previously presented): A process according to claim 16 or 33, wherein the artificial tooth substitute is formed with fine run-out margins.

Claim 18 (currently amended): A process according to claim 16 or 33, wherein the sintering of the ~~machined~~ enlarged model ~~is sintered~~ comprises sintering to a density P_s within the range of 90 to 100% of the ~~theoretically possible~~ achievable relative density.

Claim 19 (currently amended): A process according to claim 16 or 33, wherein the sintering of the ~~machined~~ enlarged model ~~is sintered~~ comprises sintering to a density P_s within the range of

96 to 100% of the ~~theoretically possible~~ achievable relative
density.

Claim 20 (currently amended): A process according to claim 16 or
33, wherein the sintering of the ~~machined~~ enlarged model ~~is~~
~~sintered~~ comprises sintering to a density P_s within the range of
greater than 99% of the ~~theoretically possible~~ achievable
relative density.

Claim 21 (previously presented): A process according to claim 16
or 33, wherein the blank is a presintered blank of pressed fine
ceramic powder.

Claim 22 (currently amended): A process according to claim 16 or
33, ~~including~~ wherein the processing includes processing the
blank in a first rough machining and then a second final
machining.

Claim 23 (currently amended): A process according to claim 16 or
33, wherein, prior to the processing, the blank is heat treated
at temperatures in the range from 50 to 200°C for a duration of
2 to 20 hours.

Claim 24 (currently amended): A process according to claim 16 or 33, wherein, prior to the processing, the blank is heat treated at temperatures in the range from 90 to 150°C for a duration of 2 to 6 hours.

Claim 25 (currently amended): A process according to claim 23, wherein the processing of the blank into the enlarged model follows the heat treatment.

Claim 26 (currently amended): A process according to claim 24, wherein the processing of the blank into the enlarged model follows the heat treatment.

Claim 27 (currently amended): A process according to claim 21, ~~wherein the presintered~~ including a step of presintering the blank ~~undergoes presintering~~ for 0.5 to 6 hours at a temperature of at least 450°C.

Claim 28 (currently amended): A process according to claim 16 or 33, wherein the ~~blank is formed of a~~ ceramic material is selected from the group consisting of Al₂O₃, TiO₂, MgO, Y₂O₃, zircon oxide mixed crystal ~~Zr_{1-x}Me_xO₂-(4n-2)_x~~ Zr_{1-x}Me_xO₂-(⁴ⁿ2)_x, and mixture thereof, where Me is a metal which is present in the oxide form as a bi-, tri-, or tetraivalent cation (n = 2, 3, 4

and $0 \leq x \leq 1$) and stabilises the tetragonal and/or cubic phase of the zircon oxide.

Claim 29 (currently amended): A process according to claim 28, wherein the ceramic material is mixed with an organic binding agent selected from the group consisting of polyvinyl alcohols (PVA), polyacrylic acids (PAA), celluloses, polyethyleneglucols, and mixtures thereof.

Claim 30 (previously presented): A process according to claim 29, wherein the proportion of binding agent lies in the range from 0.1 to 45 vol%.

Claim 31 (previously presented): A process according to claim 29, wherein the proportion of binding agent lies in the range from 0.1 to 5 vol%.

Claim 32 (currently amended): A process for production of an artificial tooth substitute to be fitted on a prepared dental stump comprising the steps of:

scanning and digitizing a three-dimensional outer and inner surface of a positive model of a skeletal structure for the artificial tooth substitute to obtain data;

determining an enlargement factor (f) for the obtained data

in accordance with the following

$$f = \sqrt[3]{\frac{\rho_s}{\rho_R}}$$

where ρ_R is the relative density of a ~~prepared~~ blank and ρ_s is the achievable relative density after sintering;

enlarging the obtained data linearly in all directions by the enlargement factor (f) thereby compensating precisely for sinter shrinkage to obtain modified data for an enlarged model;

transferring the modified data to a control unit of a processing machine for generating a desired path of a tool;

ceasing scanning and digitizing;

processing a blank of porous ceramic material in the processing machine wherein material is removed by the tool moving along the devised path to produce a design form of the enlarged model;

dense-sintering the design form of porous ceramic material to obtain a skeletal structure having precise end dimensions;
and

facing the skeletal structure as desired to form the artificial tooth substitute.

Claim 33 (currently amended): A process for production of an artificial tooth substitute to be fitted on a prepared dental stump comprising the steps of:

(a) selecting a preprepared blank of porous ceramic material having a relative density ρ_R ;

(b) sintering a further piece of the porous ceramic material under a set of sintering conditions to obtain an achievable relative density ρ_S of the ceramic material after sintering;

(c) scanning and digitizing a three-dimensional outer and inner surface of a positive model of a skeletal structure for the artificial tooth substitute to obtain data;

~~(e)~~ (d) determining an enlargement factor (f) for the obtained data in accordance with the following

$$f = \sqrt[3]{\frac{\rho_S}{\rho_R}}$$

where ρ_R is the relative density of the preprepared blank and ρ_S is the achievable relative density of the porous ceramic material after sintering obtained in step (b);

~~——(d) scanning and digitizing a three dimensional outer and inner surface of a positive model of a skeletal structure for the artificial tooth substitute to obtain data;~~

(e) enlarging the obtained data linearly in all directions by the enlargement factor (f) thereby compensating precisely for sinter shrinkage to obtain modified data for an enlarged model;

(f) transferring the modified data to a control unit of a processing machine;

(g) processing the blank of ~~the-preprepared~~ porous ceramic material in the processing machine and removing material therefrom to produce a design form of the enlarged model;

(h) sintering under the set of sintering conditions of step (b) the design form of porous ceramic material to obtain a skeletal structure having precise end dimensions; and

(i) facing the skeletal structure as desired to form the artificial tooth substitute.

Claim 34 (currently amended): A process according to claim 28, wherein the ceramic material is mixed with an organic binding agent comprising thermoplastics.

Claims 35-40 (cancelled):